The Influence of Background and External Exposures on Non-Cognitive Traits in Doctor of Physical Therapy Applicants

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Why Non-Cognitive Traits?

- Emotional intelligence correlates with grade point average in nursing students
  - Sharon and Grinberg, 2018

- Emotional intelligence correlates with academic success in medical students
  - Cook CJ, Cook CE, Hilton TN, 2016

- Improved patient outcomes and adherence to treatment plans when clinicians possess desirable non-cognitive traits
  - Koenig et al., 2013

The biopsychosocial model and psychologically informed practice require:

- Patient-centered care
- Interpersonal skills
- Strong therapeutic alliance
  - Keefe FJ, Main CJ, George SZ, 2018

Therapeutic alliance:

→ Personal flexibility, confidence, conscientiousness, extraversion, tolerance for ambiguity, grit, etc.

"Therapist effect" on chronic disease, pain?

- Ackerman SJ, Hilsenroth MJ, 2003
- Buining et al., 2015
- Kooijman et al., 2019

"A novel tool for evaluating non-cognitive traits of doctor of physical therapy learners in the United States" (Roll *et al.*, 2018)

"Non-cognitive traits"

- Emotional intelligence
- Interpersonal skills
- Social intelligence
- Psychological flexibility
- Grit
- Etc.

- Cross-sectional survey study
  - Duke, Colorado, Indianapolis universities
  - Cohort: 298 first- and second-year DPT students

Background: Development of Survey

Developed using items from non-proprietary, non-cognitive measures:

1. Schutte Self Report Emotional Intelligence Test
2. Interpersonal Reactivity Index (IRI)
3. Intolerance of Uncertainty Scale (IUS)
4. Measuring Social Intelligence (MSI)
5. Psychological Flexibility Questionnaire
6. Short Grit Scale (Grit-S)

Face Validity:

- 143 items → 68 items

Dimensional analysis:

- SPSS (IBM, ver. 24.0)
- 68 items → <u>39 items</u>

Three latent non-cognitive domains:

1. <u>Adaptability</u> (*16 items*)
   - Intolerance of Uncertainty Scale
   - Psychological Flexibility Questionnaire

2. <u>Intuitiveness</u> (*12 items*)
   - Schutte Self Report Emotional Intelligence Test
   - Measuring Social Intelligence Short Grit Scale

3. <u>Engagement</u> (*11 items*)
   - Interpersonal Reactivity Index
   - Psychological Flexibility Questionnaire

If desirable non-cognitive traits associate with improved academic performance, occupational performance, and clinical outcomes...

How can we predict and identify aspiring healthcare professionals who might possess these traits?

- - -

"Examine the relationship of **background and previous experiential exposures** *on the development of non-cognitive traits such as emotional intelligence, interpersonal skills, and psychological flexibility in Doctor of Physical Therapy* **applicants**.*"

1. Survey administered to DPT applicants at Duke University
   – Class of 2022 (n = 174)
   – 92% completed survey (**n = 160**)
   – Qualtrics survey
   – Research purposes, would not affect admission decision

2. Descriptive and demographic information extracted from Physical Therapy Centralized Application Service (PTCAS)
   – Deidentified — name → numerical identifier

Background characteristics via PTCAS included:

1. Age
2. Gender
3. Underrepresented minority status
4. First generation in one's family to attend college
5. Physical therapy shadowing hours
   – Paid
   – Volunteer
   – Total
6. Prior applicant to DPT program
7. From a school district where 50% of less of graduates go to college
8. Graduated from a high school from which a low percentage of seniors received a high school diploma
9. Family lives in a medically underserved area
10. Family receives public assistance
11. English as a second language
12. Military experience
13. Undergraduate school ranking by U.S. News

Methods: Data Analysis

Qualtrics and PTCAS data compiled into Excel document

SPSS (IBM Corp., Armonk, NY, USA)

- Roll & Cook

- Population means and standard deviations: T-test

- Continuous variables: Pearson coefficient

- Dichotomous variables: Phi coefficient

- Statistically significant: $p < .05$

- Extreme non-cognitive domains: Survey response of 1 or 5 on Likert Scale

Results: Characteristics ⇄ Non-Cog Domains

Table 2. Association of Individual Characteristics to Non-Cognitive Domains and Total Score

	Baseline Adaptability Score	Baseline Intuitiveness Score	Baseline Engagement Score	Baseline Total Non-Cogs Score
Age				
Gender				
Underrepresented Minority Status				
1st gen				
Volunteer Hours				
Paid Hours				
Total Hours				
Prior Applicant				
50% or less go to college				
Low graduation rate HS				
Economically Disadvantaged				
Family gets Public Assistance				
English Secondary Language				
Military Experience				
School Ranking				

*<0.05 **<0.01

- <u>Adaptability</u>
  - Age ($p < .01$)**
  - **Prior applicant** ($p < .05$)*
  - **Military experience** ($p < .05$)*

- <u>Intuitiveness</u>
  - **Prior applicant** ($p < .05$)*
  - Low graduation rate high school ($p < .05$)*

- <u>Engagement</u>
  - Undergraduate school ranking ($p < .05$)*

- <u>Total Non-Cognitive Score</u>
  - **Prior applicant** ($p < .01$)**
  - **Military experience** ($p < .05$)*

Results: Characteristics ⇄ Extreme Non-Cog Domains

Table 3. Associated of Individual Characteristics to Extreme Non-Cognitive Domains and Total Score

	Baseline Adaptability Score (Extremes)	Baseline Intuitiveness Score (Extremes)	Baseline Engagement Score (Extremes)	Baseline Total Non-Cogs Score (Extremes)
Age				
Gender				
1st gen				
Underrepresented Minority Status				
Volunteer Hours				
Paid Hours				
Total Hours				
Prior Applicant				
50% or less go to college				
Low graduation rate HS				
Economically Disadvantaged				
Family gets Public Assistance				
English Secondary Language				
Military Experience				
School Ranking				

*<0.05 **<0.01

Results: Characteristics ⇄ Extreme Non-Cog Domains

- **Adaptability**
  - Total shadowing hours ($p < .05$)*
  - Family receives public assistance ($p < .05$)*

- **Intuitiveness**
  - 50% or less high school graduates go to college ($p < .01$)**
  - English as a second language ($p < .01$)**
  - Military experience ($p < .01$)**
  - Underrepresented minority status ($p < .05$)*
  - Low graduation rate high school ($p < .05$)*
  - Socioeconomically disadvantaged area ($p < .05$)*
  - Family receives public assistance ($p < .05$)*

- **Engagement**
  - N/A

- **Total Non-Cognitive Score**
  - Low graduation rate high school ($p < .05$)*
  - Socioeconomically disadvantaged area ($p < .05$)*
  - Family receives public assistance ($p < .05$)*

Many **positive correlations,** but **generally weak.**

Background Characteristics and Non-Cognitive Domains:
– Common themes:
  • Prior applicant to DPT program
  • Military experience

Background Characteristics and *Extreme* Non-Cognitive Domains:
– Common themes:
  • Family and areas with poor socioeconomic status
  • Areas with poor high school graduation rates, college admissions
  • English as second language and minority status

Unanswered Questions:
- Do these **characteristics** reliably predict **desirable non-cognitive traits?**
  - Significant, but not strong, associations
- Are **background characteristics** useful for **admissions committees?**
- Do environmental factors **develop** desirable traits or simply **select for** desirable traits?
- Is **extreme response style** (top and bottom 15% in total non-cog scores) in this survey a **desirable trait?**

Limitations:
- Length of survey
- Survey taken on interview day
- Survey answered honestly?
- Limited to PTCAS data

Future Directions

Survey will continue to be administered to incoming classes
- Analysis might benefit from larger and more diverse cohorts

Multivariate analysis?

"Nature vs. Nurture"
- Relative contributions of environment and heritability

Concurrent Validity:
- Track cohorts over time
- Investigate non-cognitive correlations with:
  - Academic performance
  - NPTE pass rates
  - Become clinical instructor?
  - Join residency program?

Acknowledgements